

ODOR CONTROL IN AMINE SALT CONTAINING COSMETIC COMPOSITIONS

BACKGROUND OF THE INVENTION

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Field of the Invention

[0001] The invention concerns cosmetic compositions containing ammonium salts, particularly those with organic acids, wherein is achieved control of odor emanating from released free amines.

10 The Related Art

[0002] Amines of a sufficiently low molecular weight to be volatile leave an identifiable odor. As a class of materials, volatile amines smell fish-like. This odor is usually unpleasant.

15 [0003] Volatility and thereby smell is greatly reduced when the amines are quaternized in salt form. Quaternized amines have found particular usefulness in cosmetic compositions. They have been used as cationic counterions to alpha-hydroxycarboxylic acids. Representative disclosures include U.S. Patent 4,105,782, U.S. Patent 4,105,783, U.S. Patent 4,197,316, U.S. Patent 4,234,599 and U.S. Patent 5,091,171 all to
20 Yu and Van Scott.

- 5 [0004] WO 01/85129 A2 (Cole et al.) disclose the N,N-dimethylethanolammonium (DMAE) salts of dermatologically active acids. The latter are identified as alpha-hydroxy acid, ascorbic acid, lipoic acid and combinations thereof. Besides use of a first neutralizing agent such as DMAE, the disclosure suggests use of a second neutralizing agent which may be an inorganic (e.g. sodium or potassium hydroxide), an amine (e.g. triethanolamine) or an amino acid (e.g. arginine, lysine or tyrosine).
- 10 [0005] Organic acids other than alpha-hydroxy functionalized ones have been disclosed in the cosmetic literature. For instance, U.S. Patent 5,641,495 (Jokura et al.) discloses in combination a ceramide or pseudoceramide with a dicarboxylic acid and a salt of a dicarboxylic acid. Malonic acid is the lowest molecular weight species of the group. The acids can be neutralized with alkanolamines, basic amino acids and ammonia.
- 15 [0006] Hitherto the art has not focused upon the latent odor problem. This may have resulted from preoccupation with identifying dermatologically active ingredients rather than any concern over aesthetics.
- [0007] Particular advantage of the present invention is that a solution is proposed to the problem caused by release of free amine.

SUMMARY OF THE INVENTION

- [0008] A cosmetic composition is provided which includes:
- (i) a first amine present as a neutralized counterion salt of a C₂-C₄₀ carboxylic acid other than an alpha- or beta-hydroxycarboxylic acid;
 - (ii) a second amine different from the first amine and having a molecular weight no lower than about 100; and
 - (iii) from about 1 to about 99.9% by weight of a cosmetically acceptable carrier.

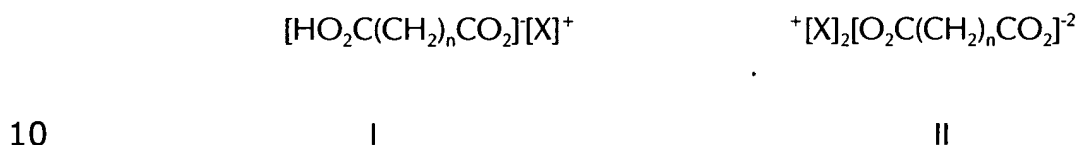
DETAILED DESCRIPTION OF THE INVENTION

[0009] Now it has been found that formulating a second amine into a cosmetic composition containing a cationic ammonium salt (formed by a first amine reacting with a carboxylic acid) prevents release of the first amine as a smelly volatile substance. Release often happens when the cosmetic composition is rubbed into the skin. Although not wishing to be bound by any theory, it is possible that the high pH of skin releases the first amine from the salt thereby giving rise to the odor.

[00010] Sometimes a formulator may desire just the slightest hint of an amine smell as product is rubbed into the skin. By use of the second amine in measured amount, perhaps in the context of a buffer, the cosmetic formulation can be tweaked to release a finite amount of amine fragrance on rub-in yet avoid any lingering or continuous odor release.

- [00011] The second amine is preferred to have a molecular weight of at least 100, preferably greater than 120, more preferably at least 149 and optimally at least 180.
- 5 [00012] Representative of the second amine are polyethyleneimine, triethanolamine, tris(hydroxymethyl)aminomethane, triisopropanolamine, triethyleneglycol tetramine, tyrosine, glutamine, lysine, arginine and combinations thereof.
- 10 [00013] Advantageously but not necessarily the second amine will have a pKa no larger than the pKa of the first amine in released form. Typical pKa values are 7.82 and 8.30 respectively for such preferred second amines as triethanolamine and tris(hydroxymethyl)aminomethane (alternatively known as tromethamine). Typical of the first amine is dimethylamino-ethanol with pKa of 9.81.
- 15 [00014] Illustrative first amines of the present invention are those including ammonia, dimethylethanolamine, triethylamine, diethylmethylethylamine, isopropylamine and t-butylamine. Typical salts of the first amine include ammonium malonate, diammonium malonate, dimethylethanolammonium malonate, bis(dimethylethanolammonium)malonate, triethylammonium succinate, 20 diammonium adipate, and ammonium stearate.
- [00015] A wide variety of carboxylic acids including mono-, di- and higher carboxylic acid functionalized compounds are suitable in forming the anionic counterion to the first amine cation in the salt of this invention.

5 Representative but certainly not inclusive examples of monocarboxylic acids are stearic acid, palmitic acid, lauric acid, myristic acid and behenic acids. Dicarboxylic acids include malonic, succinic, glutaric, adipic, succinic, fumaric, maleic, phthalic and terephthalic acids. Most preferred are the malonic acids. When the salts of this invention are dicarboxylic acid based materials, they can either be the half or fully neutralized salts or combinations thereof as represented by general formulas (I) and (II):



wherein X is a protonated first amine, and n ranges from 1 to 30, but preferably is 1.

[00016] The present invention can utilize as the first amine neutralized salt, the mono-salt I, di-salt II or mixtures of these salts. When mixtures are present the molar ratio of mono-salt I to di-salt II may range from about 1000:1 to about 1:1000, preferably from about 10:1 to about 1:500, more preferably from about 2:1 to about 1:200, optimally from about 1:1 to about 1:20.

[00017] Amounts of the first amine neutralized carboxylic acid salt may range from about 0.0001 to about 30%, preferably from about 0.1 to about 15%, more preferably from about 0.5 to about 10%, optimally from about 1 to about 8% by weight of the cosmetic composition.

- 5 [00018] Compositions of this invention will also include a cosmetically acceptable carrier. Amounts of the carrier may range from 1 to 99.9%, preferably from about 70 to about 95%, optimally from about 80 to about 90%. Among the useful carriers are water, emollients, fatty acids, fatty alcohols, humectants, thickeners and combinations thereof. The carrier may be aqueous, anhydrous or an emulsion. Preferably the compositions are aqueous, especially water and oil emulsions of the W/O or O/W variety. Water when present may be in amounts ranging from about 5 to about 95%, preferably from about 20 to about 70%,
10 optimally from about 35 to about 60% by weight.
- [00019] Emollient materials may serve as cosmetically acceptable carriers. These may be in the form of silicone oils, synthetic esters and hydrocarbons. Amounts of the emollients may range anywhere from about 0.1 to about 95%, preferably between about 1 and about 50% by weight.
- 15 [00020] Silicone oils may be divided into the volatile and nonvolatile variety. The term "volatile" as used herein refers to those materials which have a measurable vapor pressure at ambient temperature. Volatile silicone oils are preferably chosen from cyclic (cyclomethicone) or linear polydimethylsiloxanes containing from 3 to 9, preferably from 4 to 5,
20 silicon atoms.

- 5 [00021] Nonvolatile silicone oils useful as an emollient material include polyalkyl siloxanes, polyalkylaryl siloxanes and polyether siloxane copolymers. The essentially nonvolatile polyalkyl siloxanes useful herein include, for example, polydimethyl siloxanes with viscosities of from about 5×10^{-6} to $0.1 \text{ m}^2/\text{s}$ at 25 C. Among the preferred nonvolatile emollients useful in the present compositions are the polydimethyl siloxanes having viscosities from about 1×10^{-5} to about $4 \times 10^{-4} \text{ m}^2/\text{s}$ at 25 C.
- 10 [00022] Another class of nonvolatile silicones are emulsifying and non-emulsifying silicone elastomers. Representative of this category is Dimethicone/Vinyl Dimethicone Crosspolymer available as Dow Corning 9040, General Electric SFE 839, and Shin-Etsu KSG-18. Silicone waxes such as Silwax WS-L (Dimethicone Copolyol Laurate) may also be useful.
- 15 [00023] Among the ester emollients are:
- (1) Alkenyl or alkyl esters of fatty acids having 10 to 20 carbon atoms. Examples thereof include isoarachidyl neopentanoate, isononyl isonanonoate, oleyl myristate, oleyl stearate, and oleyl oleate.
 - (2) Ether-esters such as fatty acid esters of ethoxylated fatty alcohols.

- 5 (3) Polyhydric alcohol esters. Ethylene glycol mono and di-fatty acid esters, diethylene glycol mono- and di-fatty acid esters, polyethylene glycol (200-6000) mono- and di-fatty acid esters, propylene glycol mono- and di-fatty acid esters, polypropylene glycol 2000 monooleate, polypropylene glycol 2000 monostearate, ethoxylated propylene glycol monostearate, glyceryl mono- and di-fatty acid esters, polyglycerol poly-fatty esters, ethoxylated glyceryl mono-stearate, 1,3-butylene glycol monostearate, 1,3-butylene glycol distearate, polyoxyethylene polyol fatty acid ester, sorbitan fatty acid esters, and polyoxyethylene sorbitan fatty acid esters are satisfactory polyhydric alcohol esters. Particularly useful are pentaerythritol, trimethylolpropane and neopentyl glycol esters of C_1 - C_{30} alcohols.
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- 15 (4) Wax esters such as beeswax, spermaceti wax and tribehenin wax.
- (5) Sterols esters, of which cholesterol fatty acid esters are examples thereof.
- (6) Sugar ester of fatty acids such as sucrose polybehenate and sucrose polycottonseedate.
- 20 [00024] Hydrocarbons which are suitable cosmetically acceptable carriers include petrolatum, mineral oil, C_{11} - C_{13} isoparaffins, polyalphaolefins, and especially isohexadecane, available commercially as Permethyl 101A from Presperse Inc.

- [00025] Fatty acids having from 10 to 30 carbon atoms may also be suitable as cosmetically acceptable carriers. Illustrative of this category are pelargonic, lauric, myristic, palmitic, stearic, isostearic, hydroxystearic, oleic, linoleic, ricinoleic, arachidic, behenic and erucic acids.
- 5 [00026] Fatty alcohols having from 10 to 30 carbon atoms are another useful category of cosmetically acceptable carrier. Illustrative of this category are stearyl alcohol, lauryl alcohol, myristyl alcohol and cetyl alcohol.
- [00027] Humectants of the polyhydric alcohol-type can be employed as cosmetically acceptable carriers. Typical polyhydric alcohols include
10 glycerol, polyalkylene glycols and more preferably alkylene polyols and their derivatives, including propylene glycol, dipropylene glycol, polypropylene glycol, polyethylene glycol and derivatives thereof, sorbitol, hydroxypropyl sorbitol, hexylene glycol, 1,3-butylene glycol, isoprene glycol, 1,2,6-hexanetriol, ethoxylated glycerol, propoxylated
15 glycerol and mixtures thereof. The amount of humectant may range anywhere from 0.5 to 50%, preferably between 1 and 15% by weight of the composition.
- [00028] Thickeners can be utilized as part of the cosmetically acceptable carrier of compositions according to the present invention. Typical thickeners
20 include crosslinked acrylates (e.g. Carbopol 982®), hydrophobically-modified acrylates (e.g. Carbopol 1382®), cellulosic derivatives and natural gums. Among useful cellulosic derivatives are sodium carboxymethylcellulose, hydroxypropyl methocellulose, hydroxypropyl cellulose, hydroxyethyl cellulose, ethyl cellulose and hydroxymethyl

5 cellulose. Natural gums suitable for the present invention include guar, xanthan, sclerotium, carrageenan, pectin and combinations of these gums. Inorganics may also be utilized as thickeners, particularly clays such as bentonites and hectorites, fumed silicas, and silicates such as magnesium aluminum silicate (Veegum®). Amounts of the thickener may range from 0.0001 to 10%, usually from 0.001 to 1%, optimally from 0.01 to 0.5% by weight.

10 [00029] Cosmetic compositions of the present invention may be in any form. These forms may include lotions, creams, roll-on formulations, sticks, mousses, aerosol and non-aerosol sprays and fabric (e.g. nonwoven textile)-applied formulations.

15 [00030] Surfactants may also be present in cosmetic compositions of the present invention. Total concentration of the surfactant when present may range from about 0.1 to about 40%, preferably from about 1 to about 20%, optimally from about 1 to about 5% by weight of the composition. The surfactant may be selected from the group consisting of anionic, nonionic, cationic and amphoteric actives. Particularly preferred nonionic surfactants are those with a C₁₀-C₂₀ fatty alcohol or acid hydrophobe condensed with from 2 to 100 moles of ethylene oxide or propylene oxide per mole of hydrophobe; C₂-C₁₀ alkyl phenols condensed with from 2 to 20 moles of alkylene oxide; mono- and di-fatty acid esters of ethylene glycol; fatty acid monoglyceride; sorbitan, mono- and di- C₈-C₂₀ fatty acids; and polyoxyethylene sorbitan as well as combinations thereof. Alkyl polyglycosides and saccharide fatty amides (e.g. methyl gluconamides) are also suitable nonionic surfactants.

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- [00031] Preferred anionic surfactants include soap, alkyl ether sulfates and sulfonates, alkyl sulfates and sulfonates, alkylbenzene sulfonates, alkyl and dialkyl sulfosuccinates, C₈-C₂₀ acyl isethionate, C₈-C₂₀ alkyl ether phosphates, C₈-C₂₀ sarcosinates and combinations thereof.
- 5 [00032] Sunscreen actives may also be included in compositions of the present invention. Particularly preferred are such materials as ethylhexyl p-methoxycinnamate, available as Parsol MCX[®], Avobenzene, available as Parsol 1789[®] and benzophenone-3, also known as Oxybenzone. Inorganic sunscreen actives may be employed such as microfine titanium
10 dioxide, zinc oxide, polyethylene and various other polymers. Amounts of the sunscreen agents when present may generally range from 0.1 to 30%, preferably from 2 to 20%, optimally from 4 to 10% by weight.
- [00033] Preservatives can desirably be incorporated into the cosmetic compositions of this invention to protect against the growth of potentially
15 harmful microorganisms. Suitable traditional preservatives for compositions of this invention are alkyl esters of para-hydroxybenzoic acid. Other preservatives which have more recently come into use include hydantoin derivatives, propionate salts, and a variety of quaternary ammonium compounds. Cosmetic chemists are familiar with
20 appropriate preservatives and routinely choose them to satisfy the preservative challenge test and to provide product stability. Particularly preferred preservatives are phenoxyethanol, methyl paraben, propyl paraben, imidazolidinyl urea, sodium dehydroacetate and benzyl alcohol. The preservatives should be selected having regard for the use
25 of the composition and possible incompatibilities between the

preservatives and other ingredients in the emulsion. Preservatives are preferably employed in amounts ranging from 0.01% to 2% by weight of the composition.

5 [00034] Compositions of the present invention may include vitamins. Illustrative
vitamins are Vitamin A (retinol), Vitamin B₂, Vitamin B₆, Vitamin C,
Vitamin E and Biotin. Derivatives of the vitamins may also be employed.
For instance, Vitamin C derivatives include ascorbyl tetraisopalmitate,
magnesium ascorbyl phosphate and ascorbyl glycoside. Derivatives of
10 Vitamin E include tocopheryl acetate, tocopheryl palmitate and
tocopheryl linoleate. DL-panthenol and derivatives may also be
employed. Total amount of vitamins when present in compositions
according to the present invention may range from 0.001 to 10%,
preferably from 0.01% to 1%, optimally from 0.1 to 0.5% by weight.

15 [00035] Another type of useful substance can be that of an enzyme such as
oxidases, proteases, lipases and combinations. Particularly preferred is
superoxide dismutase, commercially available as Biocell SOD from the
Brooks Company, USA.

20 [00036] Skin lightening compounds may be included in the compositions of the
invention. Illustrative substances are placental extract, lactic acid,
niacinamide, arbutin, kojic acid, ferulic acid, resorcinol and derivatives
including 4-substituted resorcinols and combinations thereof. Amounts
of these agents may range from about 0.1 to about 10%, preferably from
about 0.5 to about 2% by weight of the compositions.

- 5 [00037] A variety of herbal extracts may optionally be included in compositions of this invention. Illustrative are green tea, chamomile, licorice and extract combinations thereof. The extracts may either be water soluble or water-insoluble carried in a solvent which respectively is hydrophilic or hydrophobic. Water and ethanol are the preferred extract solvents.
- 10 [00038] Also included may be such materials as retinoxytrimethylsilane (available from Clariant Corp. under the Silcare 1M-75 trademark), dehydroepiandrosterone (DHEA) and combinations thereof. Ceramides (including Ceramide 1, Ceramide 3, Ceramide 3B and Ceramide 6) as well as pseudoceramides may also be utilized but for many compositions of the present invention may also be excluded. Amounts of these materials may range from about 0.000001 to about 10%, preferably from about 0.0001 to about 1% by weight.
- 15 [00039] Colorants, fragrances, opacifiers and abrasives may also be included in compositions of the present invention. Each of these substances may range from about 0.05 to about 5%, preferably between 0.1 and 3% by weight.
- 20 [00040] The term "comprising" is meant not to be limiting to any subsequently stated elements but rather to encompass non-specified elements of major or minor functional importance. In other words the listed steps, elements or options need not be exhaustive. Whenever the words "including" or "having" are used, these terms are meant to be equivalent to "comprising" as defined above.

[00041] Except in the operating and comparative examples, or where otherwise explicitly indicated, all numbers in this description indicating amounts of material ought to be understood as modified by the word "about".

5 [00042] The following examples will more fully illustrate the embodiments of this invention. All parts, percentages and proportions referred to herein and in the appended claims are by weight unless otherwise illustrated.

EXAMPLE 1

10 [00043] A typical cosmetic cream according to the present invention is outlined under Table I.

TABLE I

INGREDIENT	WEIGHT %
PHASE A	
Water	Balance
Disodium EDTA	0.05
Methyl Paraben	0.15
Magnesium Aluminum Silicate	0.60
Triethanolamine	1.20
PHASE B	
Xanthan Gum	0.20
Natrosol® 250HHR (ethyl cellulose)	0.50
Butylene Glycol	3.00
Glycerin	2.00
PHASE C	
Sodium Stearoyl Lactylate	0.10
Glycerol Monostearate	1.50
Stearyl Alcohol	1.50
Isostearyl Palmitate	3.00
Silicone Fluid	1.00
Cholesterol	0.25
Sorbitan Stearate	1.00

Butylated Hydroxy Toluene	0.05
Vitamin E Acetate	0.01
PEG-100 Stearate	2.00
Stearic Acid	3.00
Propyl Paraben	0.10
Parsol MCX®	2.00
Caprylic/Capric Triglyceride	0.50
Hydroxycaprylic Acid	0.01
C12-15 Alkyl Octanoate	3.00
PHASE D	
Diammonium Malonate	3.00
PHASE E	
Vitamin A Palmitate	0.10
Bisabolol	0.01
Vitamin A Acetate	0.01
Fragrance	0.03
Retinol 50C	0.02

EXAMPLE 2

- 5 [00044] A water-in-oil topical liquid make-up foundation according to the present invention is described in Table II below.

TABLE II

INGREDIENT	WEIGHT %
PHASE A	
Cyclomethicone	9.25
Cetyl Octanoate	2.00
Dimethicone Copolyol	20.00
PHASE B	
Talc	3.38
Pigment (Iron Oxides)	10.51
Spheron L-1500 (Silica)	0.50
PHASE C	
Synthetic Wax Durachem 0602	0.10
Arachidyl Behenate	0.30
PHASE D	
Cyclomethicone	1.00
Trihydroxystearin	0.30
PHASE E	
Laureth-7	0.50
Propyl Paraben	0.25
PHASE F	
Fragrance	0.05
PHASE G	
Water	balance
Ammonium Malonate	3.00
Tyrosine	0.50
Methyl Paraben	0.12
Propylene Glycol	8.00
Niacinamide	4.00
Glycerin	3.00
Sodium Chloride	2.00
Sodium Dehydroacetate	0.30

EXAMPLE 3

[00045] Illustrated herein is a skin cream according to the present invention.

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TABLE III

INGREDIENT	WEIGHT %
Glycerin	6.93
Niacinamide	5.00
Dimethylethanolammonium Malonate	5.00
Tris(hydroxymethyl) Amino Methane	1.00
Permethyl 101A ¹	3.00
Sepigel 305 ²	2.50
Q2-1403 ³	2.00
Isopropyl Isostearate	1.33
Arlatone 2121 ⁴	1.00
Cetyl Alcohol CO-1695	0.72
SEFA Cottonate ⁵	0.67
Tocopherol Acetate	0.50
Panthenol	0.50
Stearyl Alcohol	0.48
Titanium Dioxide	0.40
Disodium EDTA	0.10
Glydant Plus ⁶	0.10
PEG-100 Stearate	0.10
Stearic Acid	0.10
Purified Water	Balance

¹ Isohexadecane, Presperse Inc., South Plainfield, NJ

² Polyacrylamide(and)C13-14 Isoparaffin(and) Laureth-7, Seppic Corporation, Fairfield, NJ

³ dimethicone(and)dimethiconol, Dow Corning Corp. Midland, MI

⁴ Sorbitan Monostearate and Sucrococoate, ICI Americas Inc., Wilmington, DE

⁵ Sucrose ester of fatty acid

⁶ DMDM Hydantoin (and) Iodopropynyl Butylcarbamate, Lonza Inc., Fairlawn, NJ

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EXAMPLE 4

[00046] Illustrative of a powdered cosmetic composition according to the present invention is the formula of Table IV.

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TABLE IV

INGREDIENT	WEIGHT %
Polysilicone-11	22.5
Cyclomethicone	53
Petrolatum	11
Ammonium Succinate	7
Triisopropanolamine	1
Dimethicone Copolyol	0.5

EXAMPLE 5

10 [00047] A relatively anhydrous composition according to the present invention is reported in Table V.

TABLE V

INGREDIENT	WEIGHT %
Cyclomethicone	80.45
Dimethicone	9.60
Squalane	6.00
Isostearic Acid	1.90
Borage Seed Oil	0.90
Ammonium Malonate (50% in water)	0.50
Triethyleneglycol Tetramine	0.20
Retinyl Palmitate	0.25
Ceramide 6	0.10
Tocopherol	0.10

EXAMPLE 6

[00048] An aerosol packaged foaming cleanser suitable for the present invention is outlined in Table VI.

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TABLE VI

INGREDIENT	WEIGHT %
Sunflower Seed Oil	20.00
Maleated Soybean Oil	5.00
Silicone Urethane	1.00
Polyglycero-4 Oleate	1.00
Sodium C14-16 Olefin Sulfonate	15.00
Sodium Lauryl Ether Sulphate (25% active)	15.00
Cocoamidopropylbetaine	15.00
DC 1784® (Silicone Emulsion 50%)	5.00
Polyquaternium-11	1.00
Bis(dimethylethanolammonium) Malonate	1.00
Triethanolamine	0.20
Water	Balance

10 [00049] An aerosol is prepared using 92% by weight of the concentrate in Table VI and 8% propellant, the latter being a combination of dimethylether, isobutane and propane.

EXAMPLE 7

15 [00050] An adhesive cosmetic patch may also be formulated according to the present invention. An adhesive hydrogel is prepared by mixing 30 grams of 2-acrylamido-2-methylpropane sulphonic acid monomer in 20 grams distilled water and 5 grams of a 1% aqueous solution of methylene-bis-

5 acrylamide. The solution is then activated with 0.4% magnesium persulphate catalyst. Shortly after mixing the catalyst with the hydrogel solution, 0.1 grams ammonium malonate and 0.02 grams tris(hydroxymethyl)amino methane in 5 ml water is added. The resultant solution is coated onto a 50/50 blend of polypropylene and hydrophilic polyester and allowed to solidify. The resulting deposited hydrogel is warmed for 24 hours at 40 C in a hot air oven. Final water content of the hydrogel is 50%. A polystyrene backing layer is laid over the adhesive hydrogel.

10 EXAMPLE 8

[00051] A disposable, single use personal towelette product is described according to the present invention. A 70/30 polyester/rayon non-woven towelette is prepared with a weight of 1.8 grams and dimensions of 15
15 cm by 20 cm. Onto this towelette is impregnated a composition as outlined in Table VII below.

TABLE VII

INGREDIENT	WEIGHT %
Ammonium Malonate	5.50
Tyrosine	2.00
Glycerin	2.00
Hexylene Glycol	2.00
Disodium Capryl Amphodiacetate	1.00
Gluconolactone	0.90
Silicone Microemulsion	0.85
Witch Hazel	0.50
PEG-40 Hydrogenated Castor Oil	0.50
Fragrance	0.20
Vitamin E Acetate	0.001
Water	Balance

- 5 [00052] The foregoing description and examples illustrate selected embodiments of the present invention. In light thereof variations and modifications will be suggested to one skilled in the art, all of which are within the spirit and purview of this invention.